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Goal priming as a situated intervention tool

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Research on goal priming has shown that cues in the environment can lead to goal-directed cognition and behaviour without the need for conscious intentions. This has sparked an interest in using goal priming as an intervention tool to strategically influence behaviour in line with an individual's long-term goals. The present article first gives a brief overview of goal priming effects and their mechanisms. Then, goal priming is discussed as a situated intervention tool that changes the cognitive responses triggered by a situation and can stimulate the pursuit of long-term investment goals over short-term hedonic goals. Applying the principle of situating interventions leads to a set of recommendations for applying goal primes effectively, which are illustrated with examples from various domains.

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Goal priming refers to the activation of a goal by external cues, which can affect information processing and behaviour in an attempt to pursue the primed goal [1]. Here, a goal is a state or behaviour that has reward value and therefore motivates a person to pursue it. Goal priming effects have been shown in a variety of domains. Priming the goal of impression formation leads to better memory organization and recall compared to a mere memorization goal [2], priming the concept of drinking can increase soda consumption when participants are thirsty [3], and priming 'achievement' can increase motivation and effort at difficult tasks among achievement-motivated individuals [4]. A recent meta-analysis has demonstrated that priming participants with cues of religion increases pro-social behaviour, especially among religious participants, thus among participants for whom the primed concept has

motivational significance [5]. A meta-analysis across domains has shown that the exposure to goal-related words can reliably trigger goal-directed behaviour, and again especially if the primed outcome is strongly valued by individuals [6**]. Building on these findings, I suggest here that priming outcomes that individuals value can be used to stimulate the pursuit of long-term goals, and thus benefit individuals and society.

How does goal priming work? What are some of the mechanisms by which a simple external cue, for example words or images representing a certain concept, can affect a person's behaviour without the need for conscious reflection and intention? Through their repeated pursuit, often in similar situations, goals are associated both with situational cues, and with effective means for pursuing them. As a result, a situational cue can serve as a prime to activate goal representations, which in turn can lead to goal-directed behaviours, without the need for conscious intentions or awareness [7,8,9,10**,11,12]. To the degree that the representation of an outcome or behaviour is indeed desirable and thus associated with reward, additional cognitive resources are recruited to support its pursuit [11,13], for example to keep the goal active in mind until a suitable opportunity for goal pursuit arises, and to inhibit temptations that would interfere with goal pursuit [9]. In addition, nonconscious goals are supported by seeing the world in ways that facilitate reaching them, for example by perceiving relevant external stimuli as bigger in size, allocating more attention to them, and evaluating them more positively when they serve an active goal (for a detailed review, see [9]). Thus, fundamental processes of learning and information processing are involved in facilitating the effective pursuit of those things that individuals value, without requiring conscious intentions and awareness (see also [12]).

The need for nonconscious intervention tools

The fact that external cues can trigger goal-directed behaviour without conscious intentions has sparked interest in this aspect of nonconscious self-regulation among researchers studying behaviour change, for example in the domain of health. Typically, attempts to modify behaviour that rely on social psychological principles have been built heavily on conscious intentions, such as in protection motivation theory or the theory of planned behaviour [14,15]. More recently, however, we have clearly seen the limits of intentions for behaviour change (e.g., [16]), with researchers requesting to 'retire' the theory of planned behaviour [17] and to increase the focus on automatic, non-intentional processes (e.g., [18–22]).

Why do conscious intentions only have limited effectiveness for behaviour change? Our current living environments tend to expose us to cues that activate well-ingrained habits and short-term *hedonic goals*, such as indulging in tempting food or drink that provide immediate pleasure, or spending financial and environmental resources on a fun new gadget. Indeed, the exposure to a tempting stimulus is likely to trigger simulations of interacting with it and enjoying it, making thoughts of a competing long-term goal less accessible [10^{**},12,23^{*},24,25]. Especially under conditions of low inhibitory control and in busy and demanding environments, the pursuit of long-term goals is then increasingly unlikely [26–29]. As a result, pursuing short-term hedonic goals often comes at the cost of long-term *investment goals*, such as one's health later in life, or the maintenance of the planet for future generations [30–33] — even if we form conscious intentions to pursue them [16]. In order to enable the pursuit of a long-term goal in such tempting environments, interventions should change the initial responses to the critical situation such that the long-term goal is (re-)activated. This can be achieved by situated interventions tools such as goal priming.

Situating intervention tools

I propose that intervention tools are situated if they take into account the cognitive processes that are typically triggered in the critical situation in which behaviour change needs to take place, and attempt to change these. Recently, I have suggested that such interventions typically take the form *cueing interventions*, that modify which cognitive processes are triggered by situational cues (e.g., goal priming, nudging), or of *training interventions*, that modify the cognitive processes themselves (e.g., implementation intentions, approach-avoidance retraining) [21]. In practice, an intervention can be situated by directly *integrating it into the critical situation*, so that the situation is physically present during the intervention, as in many goal priming interventions. Alternatively, an intervention can be situated by *integrating features of the critical situation into the intervention*, so that a mental representation of the situation is evoked while the intervention takes place (see [34]), as is sometimes done in training interventions. Critically, a situated intervention recognizes that the behaviour that needs to be changed is influenced by cognitive processes triggered by the situation, so that changing behaviour can only be achieved by changing the cognitive responses that are activated (see [21]). Given the strong effects of situational cues on our behaviour, especially through processes that occur outside of conscious awareness and are therefore hard to control, I propose that situated interventions are more likely to be effective for behaviour change than nonsituated interventions.

With regard to priming, a goal priming intervention can be considered situated to the degree that primes activate

a long-term goal representation directly in the critical situation. This would be the case, for example, in a priming intervention where environmentally conscious consumers are reminded of their goal of conserving resources by a banner on a website, while they are in the process of deciding between holiday destinations reachable by train or by a long-distance flight. If, however, the goal prime was included in an email message that is read long before entering the holiday decision process, this intervention should not be considered situated, as this procedure would make it less likely that the prime actually changes the cognitive responses and resulting behaviour triggered by features of the critical situation.

I will now discuss research on health goal priming, showing that goal primes can function as situated intervention tools in both laboratory and field settings. Then, I will close by discussing some important principles for applying goal primes as a situated intervention tool, illustrated by examples from various domains.

Situated health goal priming

Controlled laboratory experiments have shown that exposing participants to cues related to long-term health goals can trigger goal-directed behaviour. Fishbach and colleagues, for example, have shown that priming diet-concerned individuals with diet-relevant words or images while they are making a food choice increases choices of healthy items [35]. More recent work has shown that seeing or consuming healthy foods can reduce subsequent unhealthy eating, mostly among dieters [36–38]. Similarly, viewing dieting advertisements while snacking, compared to control or indulgent food advertisements, can prevent overeating on unhealthy foods [39–41] — whereas priming with food advertisements can conversely increase snack intake [42]. Similarly, functional health claims on attractive foods can activate a health goal, and therefore reduce consumption [43^{**}]. Even though this research was conducted in controlled laboratory environments, goal primes were used in a situated manner as they were integrated into the situations in which the critical behaviour took place. Further studies into the underlying mechanisms of these effects suggest that priming participants with personal long-term goals, including health goals, inhibits thoughts about short-term hedonic goals that would interfere with the pursuit of their long-term goals and limits visual attention to cues for such goals [35,44,45]. Thus, goal primes may work by directing attention to information that is congruent with the long-term investment goal [46], at the expense of cues for conflicting short-term hedonic goals (see [9,31]).

Findings from field settings are largely consistent with those from situated laboratory tests of goal priming. Papies and Hamstra [47] placed a poster announcing a low-calorie recipe on the inside of the glass door to a butcher store, which included words like ‘slim figure’,

'extra slim', and 'weight'. Compared to a control condition without such a poster, customers who had been primed with the goal of healthy eating and dieting by means of the poster consumed fewer of the freely available meat snacks, but only if they endorsed the goal of dieting. This finding was later replicated conceptually in a restaurant, where the primes were integrated into the menu and led to healthier menu choices among dieters [48] (e.g., ordering a salad instead of a burger). In a recent study with a similar set-up, a poster priming health or slimness next to a vending machine increased the sales of healthy items [49]. Finally, a field experiment in a grocery store showed that while overweight customers bought more unhealthy snacks in the control condition than normal-weight participants, their purchases of such foods were strongly reduced when they received a flyer that included health and diet-related words when entering the store [50]. Together, these studies show that goal primes can effectively modify behaviour in situations in which short-term hedonic goals typically prevail, and facilitate the pursuit of long-term health goals among those individuals who value these goals.

Applying goal primes effectively

In order to apply goal primes effectively in situations where behaviour change in favour of investment goals is desirable, a number of principles should be considered (see [21]). In general, a situated approach to goal priming implies that there is not one single effective priming strategy for all situations, even with regard to the same goal. The best implementation of a goal priming intervention is likely to vary with features of the behaviour in question, the situation in which it takes place, and the targeted individuals (see [12]). More specifically, the nature of a goal priming intervention should depend on what can motivate the target person in the critical situation to perform the desired behaviour, given the constraints of the situation.

First of all, an effective goal priming intervention should identify a target group of individuals who value the long-term investment goal, since research on priming has clearly shown that goal primes are more effective when the primed concept is motivationally relevant (e.g., [5,6,11,50]). This could be, for example, individuals who are motivated to protect the environment, to improve their productivity at work, or to improve their relationship behaviour (see also [33]). Second, goal primes should activate the long-term motivation of these individuals with effective cues, and these cues should be presented close to the decision point — while making a critical consumer decision, while getting organized in the beginning of a workday, or while in a relevant interpersonal interaction. Finally, goal primes can only work if the primed individual knows which goal-directed behaviour can be performed in order to pursue the long-term investment goal, and has access to such a behaviour — such

as identifying and being able to choose a sustainable consumer product, an effective time management plan, or a forgiving, rather than an escalating response to a partner. These principles (see [21] for a more detailed discussion) illustrate that a goal prime is most likely to be effective if it takes into account the characteristics of the individual, the critical situation, and the effects of the situation on the individual [34]. This way, applying the notion of situating an intervention leads to a systematic set of recommendations for effective use of goal primes — and most likely, for other intervention tools, too.

Conclusion

Goal priming effects have been demonstrated in a wide variety of domains, provided that the primed concept is motivationally relevant to the perceiver in the given situation. On the basis of general finding, I have argued that goal primes can be used as situated intervention tools by integrating them into the critical situations, in order to change which cognitive responses are activated by the situation and influence behaviour. This is particularly important given our current living environment, where short-term hedonic goals are much more likely to be activated and pursued in response to environmental cues than long-term investment goals. While much recent debating has focused on conditions for replicating priming effects, the current paper aims to put our advances in theorizing about goal priming mechanisms to good use for the future [51], and to make them available for applications to benefit individual and societal health. Future research to further bolster this approach should study in more detail the recommendations that were derived from applying the notion of situated interventions to goal priming as outlined here, and should examine the conditions under which priming can be used to stimulate beneficial goal pursuit over extended periods of time.

Conflict of interest statement

Nothing declared.

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